OFFICE COPY

CACTUS AND SUCCULENT JOURNAL

Of the Cactus And Succulent Society Of America

Vol. XIII OCTOBER, 1941 No. 10

FIG. 93. WHO'S WHO

R. A. Dyer, co-author with Alain White and Boyd L. Sloane on the new Euphorbia monograph. Photo shows a typical view of his field work in South Africa.

CACTUS AND SUCCULENT JOURNAL

Published and Owned by the Cactus and Succulent Society of America, Inc., Box 101, Pasadena, California. A monthly magazine to promote the Society and devoted to Cacti and Succulents for the dissemination of knowledge and the recording of hitherto unpublished data in order that the culture and study of these particular plants may attain the popularity which is justly theirs. Subscription $3.00 per year. Foreign $3.00 per year by international money order. Membership in the Cactus Society free with subscription. Mail application to SCOTT HASELTON, *Editor*, Box 101, Pasadena, Calif. *Editorial Staff:* THE ENTIRE SOCIETY. Entered as Second Class Matter at Pasadena, Calif., under act of March 3, 1879.

Vol. XIII OCTOBER, 1941 No. 10

Observations on Furcraeas and Agaves ..... William Hertrich 159
Cascading Epiphyllums ..... Dr. Jacolyn Manning 162
Six Rules for Beginners ..... Southern California Cactus Exchange 164
Some New Species of Stapelieae from East Africa ..... Eileen A. Bruce and Peter R. O. Bally 165
One Year Under Glass ..... Emil J. Clark 169

AMENDMENTS TO THE BY-LAWS

At an Executive Board Meeting, held on September 12, 1941, it was unanimously voted to amend Article 1 of the By-Laws of the Cactus and Succulent Society of America to read as follows.

Section 1. There shall be five classes of membership: Active, Active (non-subscribing), Life, Commercial, and Fellowship.

Section 2. Any person interested in Cacti and Succulents shall be eligible for active membership, provided he has duly applied for membership and the annual dues of the Society, including subscription to the JOURNAL, shall have been paid in advance.

Section 3. Any person in the immediate family of an active member who resides at the same address as the active member shall be eligible for active (non-subscribing) membership, provided he has duly applied for active (non-subscribing) membership and the annual dues of $1.00 for this class of membership has been paid in advance.

An active (non-subscribing) member shall have all the rights and privilege of active membership including the right to vote and to be appointed as delegate to conventions and regional meetings.

Dues from active (non-subscribing) membership shall be placed in the general fund of the Society.

Section 4. Any person may become a Life Member upon payment of $100, with the approval of the Board, and shall thereafter be exempt from the payment of all further dues. Life Members shall be entitled to all the privileges and rights of Active Members. Life Membership may be conferred on anyone for valuable aid or services rendered toward the advancement of the Society by majority vote at a regular meeting after recommendation by the Board.

Section 5. A Commercial Member is a reputable dealer in cactus and/or other succulents whose application has been proposed for this class of membership by a Board Member and who has been duly elected by the Board.

A complete listing of all Commercial Members giving the business name, address, and type of business, shall be made in each issue of the JOURNAL of the Society.

Dues for Commercial Members shall be $3.00 per year in addition to the regular membership dues and this additional fee shall be deposited in the general fund of the Society.

Section 6. Article 1. Fellowship in the Society is a recognition of outstanding contributions to the advancement of interest in Xerophytic plants either by research, writings, field work, or by a substantial contribution of funds for these purposes.

A Fellow of the Cactus and Succulent Society is entitled to use his title or the initials F.C.S.S. after his name to indicate his standing.

A Fellow of the Society shall be elected to this honor, at the Board's discretion, at any regular or called meeting, if nominated by a Board Member or by an Affiliated Club.

Dues of a Fellow of the Society shall be $3.00 per year, in addition to the regular membership fees. Such payments shall be deposited in the general fund of the Society.

At its discretion, the Board may remit all Fellowship dues in the case of a Fellowship awarded for research, writing or field work for the advancement of interest in Xerophytic plants.

Fellowship in the Society shall be contingent on membership in the Society and no Fellowship shall be continued after membership in the Society has lapsed.

W. TAYLOR MARSHALL, *President.*
GRAHAM HEID, *Secretary.*

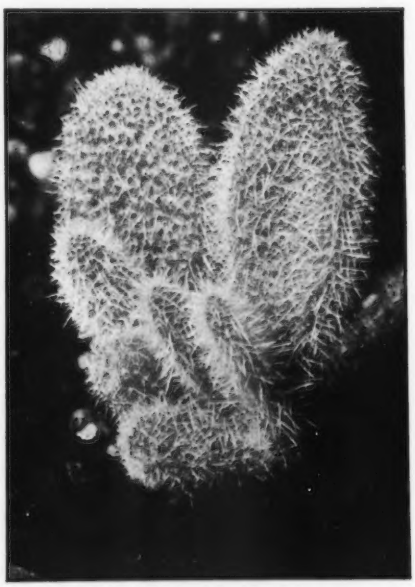

FIG. 94. This Opuntia was recently discovered in Vermont by Oliver P. Young. Can you name it?
See page 171.

FIG. 95. *Furcraea Roezlii* (left) and *Agave Franzosini* (right) in flower in Huntington Botanical Gardens, San Marino, California.

Observations on Furcraeas and Agaves

By WILLIAM HERTRICH, *Curator*

All photos by author

The familiar "Century Plant," botanically known as *Agave,* is frequently found in the gardens of southern California. However, the *Furcraea,* similar in appearance to the *Agave* and also a member of the Amaryllis family, is seen less often. Both of these plants are strictly American. The *Agave,* found as far north as the state of Utah, grows in profusion in many sections of Mexico and extends southward as far as northern South America. The genus *Furcraea,* on the other hand, does not have such a wide distribution, as it is confined to the tropical sections of the American continent. However, species of both genera have been introduced into many other countries where climatic conditions are favorable for their out-of-door cultivation, and are occasionally found growing in conservatories in colder sections where they attract considerable attention when in flower.

There are only ten, or possibly a dozen species of *Furcraeas.* Some of them have trunks, while others are dwarf. All of them form a rosette of leaves which, depending upon the species, ranges from two to five feet in length and from four to six inches wide, tapering to a sharp point. Their leaves may be rigid or flexible, smooth, or heavily armed along the margins. The color ranges through various shades of green, some are grayish green and one or two are bluish gray. A few are striped through the center and along the margins. Greenish-white flowers are produced in great quantities on loose panicles, supported by a stout shaft which is from ten to thirty-five feet high, depending upon the species. Very few *Furcraeas* set seed. However, all of the species cultivated at the Huntington Botanical Gardens produce quantities of bulbils and these, in some instances are from four to six inches long before they drop to the ground, where, under favorable conditions, they take root and form young plants. It was these bulbils that first attracted our attention because of their great tenacity to retain life over a long period of time under very unfavorable conditions. We noticed them in the field, blown about by the wind, falling on all types of terrain. Some, dropping to

FIG. 96. *Agave tequilana* Weber, (left) showing secondary growth from bulbils. *A. Murpheyi* F. Gibson, (right) showing bulbils and secondary growth with flowers.

the ground, took root and if given half a chance would form new plants. Others, not finding any medium upon which to establish themselves, would remain fertile for a year or more and if moved to better soil, would take root. In order to make an actual test of the life tenacity of these bulbils, we gathered one off the ground, beneath *Furcraea gigantea* var. *Willemetiana* Roem. This bulbil was tagged with the date, August 26, 1938, and placed on a book shelf in the office. It was inspected at intervals of several months and now, exactly three years later, on August 26, 1941, the accompanying photograph was taken definitely proving that this bulbil after remaining on a shelf with no moisture of any kind, is still alive and in condition to form roots.

The genus *Agave* is represented by numerous species. Berger lists 274 in his work, "Die Agaven." A good many are found in southwestern United States. They range from small plants a few inches high to specimens from six to eight feet high and from ten to twelve feet broad. Most species have rigid, armed leaves. Only in a few species is the foliage soft and pliable, without spines along the margins. The color variation is similar to that of the *Furcraea,* with the exception that there are more species with variegated leaves in the *Agaves.* The height and breadth of the inflorescence depends largely upon the species. Some reach eighteen inches while others ascend to a height of from thirty-

FIG. 97. Close up of *Agave fourcroydes* bulbils.

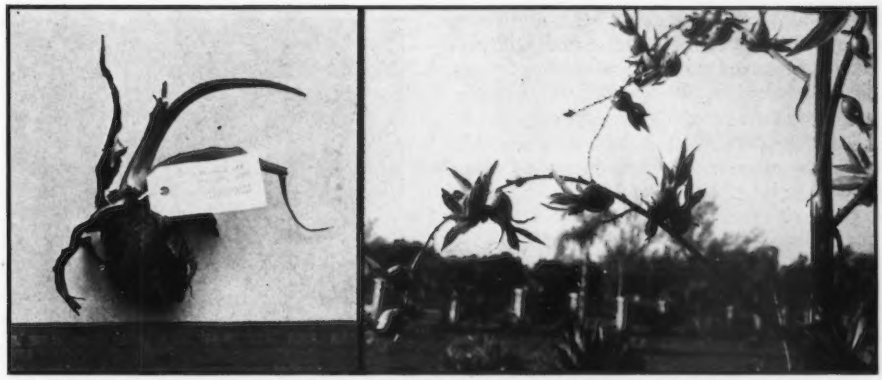

FIG. 98. Living bulbil of *Furcraea gigantea* (left) photographed Aug. 26, 1941, after it had lain 3 years on a book shelf. *F. gigantea* var. *Willemetiana* (right) showing bulbils growing on flower stalk.

five to forty feet. Many of the North American species are extremely drought resistant and can be grown on steep banks or hillsides where average plant life could not survive. However, they readily respond to good treatment and compensate for the trouble by their beauty and size. Experience at the gardens indicates that these plants reach their maturity and flower when from eight to fifteen years old, as a rule, depending upon the species and other factors, such as type of soil, cultivation, etc. Practically all species grown in the garden produce fruit and set seed freely. Some, however, also form bulbils in abundance, in a similar fashion to the *Furcraeas*. Bulbils formed on some species attain a length of from six to eight inches, before dropping to the ground by their own weight. Observations of hundreds of specimens have been made at the Huntington Botanical Gardens for over twenty-five years, of many different species coming into flower, setting fruit, forming seed and producing bulbils. Yet this is the first year that any of these plants have produced a secondary growth from bulbils! This phenomenon has been observed on two species, *Agave Murpheyi* F. Gibson and *A. tequilana* Weber. These plants flowered in the early spring of 1940, set seed, formed bulbils which are now producing a secondary growth, after adhering to the withering inflorescence for almost two years. Some of the bulbils have pushed out from fifteen to twenty-two inches of new growth, about half an inch thick, terminating either in a few flowers or in a secondary bulbil. It is difficult to comprehend the vitality of these primary bulbils, clinging to a deteriorating shaft for almost two years, and still able to muster enough strength to produce two feet of new growth!

HUNTINGTON BOTANICAL GARDENS.
August, 1941.

Cascading Epiphyllums

By JACOLYN MANNING, M.D.

Although most members of the gay and lovely Epiphyllum family can be regimented to an erect manner of growth of several feet, its native and more graceful habit is pendent, with long flower-laden stems swinging free from an airy perch on a horizontal branch of an American jungle tree.

The customary method of tying the long stems to one or several vertical stakes is a space saver, for the comparatively small forcing pot stands on the ground, while the towering growth will rarely require more than two and a half feet of linear wall space—but how much of the line of beauty is sacrificed!

This espalier method of growing the orchid-flowered Epiphyllums upright, to face a wall, is the keynote to the famous corridor of jewels of a Pasadena nursery.

Some of the exotic cacti are true climbers. With enormous creamy-white blooms they are children of one night only, and while often confused with day bloomers, they are only rivals of, and not true Epiphyllums. The Selenicerei in particular, are all lovely and fragrant, and given a proper tree will do their own climbing, and hang, pendent, in intoxicating beauty, sister moons to the moon of hot August nights; so I have seen them swing their ivory censors from

forty or fifty feet overhead, in the Maechtlen Memorial Garden, weeping tears of liquid perfume for the loved gardener, who, one summer night, was halted on his eager return.

But most of the Epiphyllums and their hybrids, many of them painted ladies, have color for their dower. Even the creamy white ones come wrapped as buds in golden yellow, rose pink, amber brown, or rich red. Most of the hybrids are day bloomers, remaining fresh and fragrant 3 to 4 and 5 days. All of them have flexible stems which, if allowed, droop in lines of beauty, or become a pendent arc from the weight of their luminous floration. Some of the most profuse bloomers have such slender stems their cargo of color drips in natural cascades—of these the famous Empress and its hybrids are usually grown in hanging baskets, or in suspended pails or pots. If not suspended, they may be placed on pedestals, or high stools, to great advantage.

Botanists declare the Empress is not a true Epiphyllum, but a serene matriarch of the species *Nopalxochia phillanthoides,* of which only she and her children have survived unknown centuries. However, the Empress hybridizes freely with various Epiphyllums. In the Spring of 1941 I cross-fertilized successively ten flowers on the Empress with other Epiphyllums as they bloomed. With little faith they would take. I did not tag each flower with the name of its cross, but beginning with Ackermannii, I made one cross each with Eden, Hermosissimus, Peacockii, Adonis, Vive Rouge, Cooperi, and a late Ackerman. At this date, August first, there are eight fruits developing on the Empress basket. A number of fine hybrids of the Empress can be seen at the Nurseries, all desirable basket plants.

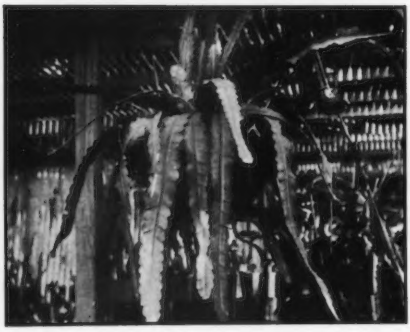

FIG. 100. Euiphyllum latona—Beahm Gardens.

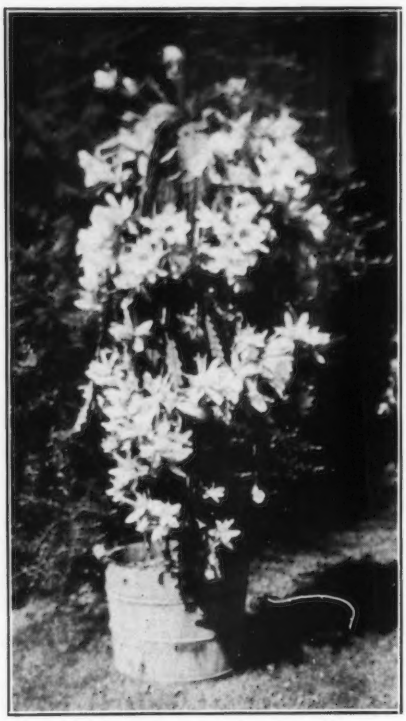

FIG. 99. Cascading Deutsche Kaiserin—Beahm Gardens

The small and medium sized Epiphyllums seen in rippling bloom in hanging pots and baskets include: Empress, Silver Chimes (terminal flowers on 3-foot branches), Queen's Pearls, Deliciosa, Lotus Lantern, Poinsettia, Inner Glow (2 feet), Rosetta, Hebe, Pink Charm, Latona, Corinne (Coral), Debonaire, Niobe, Red Kaiserin, Guatemalensi.

A modest amateur, the peer of any commercial Epiphyllum producer, maintains that all members of this prismatic family, large and small, should be grown in fountain form, either suspended from overhead or elevated on a sufficient pedestal to permit free penetration of light, air, warmth and moisture to every part of the plant. Only in this way can the perfect floration be achieved, with hundreds of blooms replacing the scant dozen now often considered an exciting cargo. I have seen *Epiphyllum stenopetalum* thus flowered, the central fountain of an enclosed patio, with a spread of six feet of rippling, dazzling, white, arching stems almost reaching the ground with the weight of bloom.

Making a study of Peacockii, with its delicate, brittle, triangular stems, it was evident they should never be required to stand upright. Who has not had a fine branch of this plant knuckle at half its length before the buds were even

formed? Peacockii is capable of making a very large plant if not asked to support her gorgeous and heavy flowers, even on a trellis. I found the answer in an exotic frost-free garden high in Sierra Madre, where a poet with sublime recognition of its needs had bloomed the tropical flowers of Peacockii, pendent, from an overhead basket.

Just so. The question is one of space. Any patio, pergola, arbor or loggia can be hung with these galleons of translucent beauty, the cascading Epiphyllums. With few exceptions any Epiphyllum, granted sufficient space and given necessary care, will present its utmost grace of line, and an almost unbelievable floration, if grown as an unhampered cascading Epiphyllum.

Photo and copyright to Dr. Manning,
187 North Craig, Pasadena.

FIG. 101. *Echeveria pulvinata,* Rose. Nat. size.

Six Rules for Beginners in Acquiring a Cactus or Succulent Collection as Recommended by the Southern California Cactus Exchange, Inc.

EDITOR'S NOTE: The Southern California Cactus Exchange appointed a committee under the direction of Frank Mark to formulate the chief reasons for failures in collecting cacti and the other succulents. Although the subject is stated in a negative form, it seems more emphatic. The committee worked hard and consulted dozens of their fellow members and the following is the consensus of opinion. Culture difficulties were stricken from the report since they believe that a study of literature and available material will help one to master the growing of plants. We do feel that the outline can be simplified and that other readers may not agree that this contains the real difficulties. Send in your comments and this fall when we start a series of articles to guide beginners we will republish an outline for their guidance.

1. **Make up your mind what TYPE and KIND of plants you wish to collect.**

Bear in mind your financial ability, your

space or room for plants and your available spare time to take care of them. For instance, if you have five acres, you could indulge in opuntias or agaves, but it would hardly be possible if you lived in a small apartment. If you are not in a position to afford it, try not to develop a taste for rare, expensive new species as such a practice will soon put a large dent in your pocketbook. Last, but not least, consider not your *entire* spare time but only that part of it that you can afford to give to your new hobby.

2. **Give the subject considerable thought and seek the advice of several, not only experienced collectors, but those you know who have made the collecting of cactus and other succulents a success.**

Such people are those who today have a well kept garden, comparatively free from diseases and pests. A good means of meeting such collectors is by joining a local cactus group such as this Exchange. It is also very desirable to not only acquire a few non-technical and inexpensive books on the subject, but to *actually read* and profit by them.

3. **Read and study all that can be found regarding the care and culture of the particular plants you are collecting and keep a complete record of the results obtained.**

Assuming that you will read up on the subject and become familiar with plant diseases, pests and nematodes, it seems hardly necessary to caution against buying or accepting any rooted plants with soil *unless* you are reasonably sure that they are clean. It is hardly conceivable that anyone would knowingly sell or give away infected plants, but it is done. Some collectors with gardens supposedly free from pests never buy or accept anything but fresh cuttings because of the danger of introducing nematodes to their premises.

4. **DON'T buy or accept more plants than you have room for or that you can and will take care of.**

DON'T accept plants in which you are not particularly interested — someone else might appreciate them more.

DON'T expect your friends to give you anything but the more common varieties; remember this, the rare ones have fixed values and may be traded to advantage.

DON'T accept plants and then neglect them; your friends may come around later and register their lack of appreciation.

DON'T take on a large collection of cacti and expect someone else in the family to take care of them.

DON'T make a practice of allowing your plants to become orphans. In other words, if a plant is worth having it is worth looking up the proper name for it and attach a suitable pot label.

5. **Start out at once with determination to learn the correct names and growth habits of the plants you collect and follow this through with all the plants in your collection.**

A very common but erroneous impression is that cacti, once stuck in the ground, require no further care; if you will read up on the subject, or listen to someone who knows, you will find that quite the contrary is true. You will learn that various soil mixtures are necessary; that proper drainage must be provided for; that partial shade is necessary for some species; that eternal vigilance must be maintained against pests and diseases; and that these are only a few of the many things that must be done Otherwise, your plants may continue to live, but they will not thrive.

6. **Do not attempt more than you can handle conveniently, otherwise your hobby will soon become a burden instead of a pleasure.**

Six rules are scarcely enough to cover even brief instructions for the beginner. There are many things usually considered in connection with cactus from which the amateur may and should derive a great deal of pleasure. Collecting minerals, purple bottles, cactus and other succulent books, grafting, desert trips, research work, writing, hybridization, or actual study, etc., are a few of the subjects that offer endless possibilities for the amateur, therefore we repeat Rule 6 as most important.

K. I. O. CACTUS CLUB

The following are the newly elected officers of the K. I. O. Cactus Club.

President, Rev. Neil E. Annable, 214 Washington St., Bellevue, Ky.

Vice-President, Lloyd F. Combs, R. R. 13, Ayres Rd., Cincinnati, Ohio.

Treasurer, H. Ranshaw, 22 East 25th St., Covington, Kentucky.

Recording Secretary, Mrs. Luella Koller, 6433 Bramble Ave., Cincinnati, Ohio.

Corresponding Secretary, Daniel Neumann, Jr., 3401 Brotherton Rd., Cincinnati, Ohio.

Past President, Jos. F. Schnurr, 3146 Rosina Ave., Latonia, Kentucky.

CACTUS AND SUCCULENT JOURNAL
TEN YEAR INDEX

Your back issues will be more usable if you have this 10-year cumulative index of 20,000 references. Mr. E. M. Baxter devoted a year's spare time to compiling this work. Most of the known plants are listed, as well as the names of people who have made cactus history these last ten years. Bound in cloth, 60 pages $1.50 postpaid. Box 101, Pasadena, Calif.

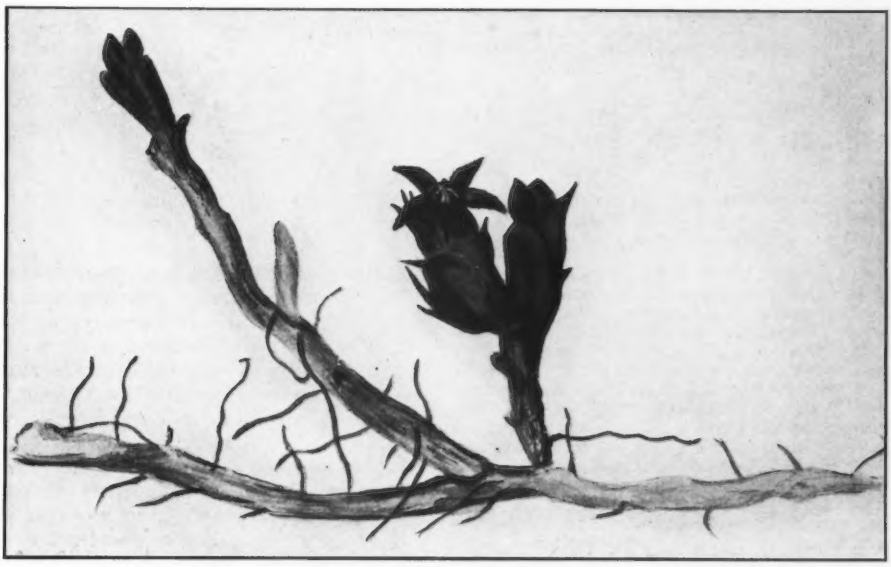

FIG. 102. *Caralluma subterranea* E. A. Bruce et P. R. O. Bally (Copied by Miss S. Ross-Craig from a drawing by P. R. O. Bally).

Some New Species of Stapelieae from East Africa

By EILEEN A. BRUCE *and* PETER R. O. BALLY*
Photos: P. R. O. BALLY

The plants to be described in the October and November JOURNAL include three new species of *Caralluma* of the "Ango" Group, an interesting *Duvalia*, an *Echidnopsis*, and two *Ceropegiae*.

The genus *Duvalia*, with the exception of one isolated species in Southern Arabia, has hitherto been regarded as almost altogether a South African genus, the only species extending into Tropical Africa being the widely spread *D. polita*. The new *Echidnopsis* is also an interesting link in the distribution of the genus, as with *E. Virchowii* from Tanganyika, it forms a connection between the northern species in Arabia and Somaliland and the southern limit in the Cape.

*Mr. Bally, Botanist at the Coryndon Memorial Museum, Nairobi, has collected much fine spirit material of the Stapelieae and taken a number of excellent photos, so that with his collaboration it has been possible to describe these new species in some detail.

Caralluma subterranea E. A. Bruce et P. R. O. Bally, sp. nov. [Asclepiadaceae]; affinis *C. Sprengeri* (Schweinf.) N. E. Br., a qua coronae lobis interioribus dorso appendiculatis, exterioribus in poculis 5 productis recedit.

Planta perennis, succulenta; caules subterranei circiter 15 cm. longi, ramosi, 2.5 cm. infra humum repenti; caules supraterranei, erecti, 2-10 cm. alti, simplices vel basin versus parce ramosi, tetragoni, virides vel griseo-virides, interdum hepatico-maculati, circiter 1 cm. diametro (dentibus exclusis); dentes oppositi et decussati, patuli, inferne conico-deltoidei, acuminati nonnumquam caudato-acuminati, crassi, 5-10 mm. longi. *Flores* 1-3-fasciculati, plerumque succedanei vel nonnumquam e quoque angulo superiore coetanei; bracteae minutae lineari-lanceolatae, circiter 1 mm. longi; pedicelli plerumque brevi, circiter 1 mm. nonnumquam usque 5 mm. longi, glabri. *Calycis lobi* patuli, lanceolati vel ovato-lanceolati, acuminati, 2-5 mm.

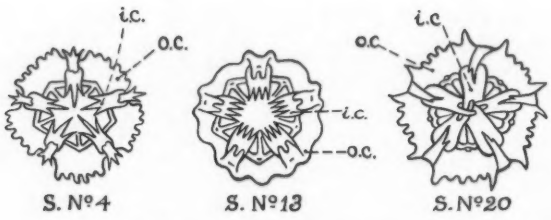

FIG. 103. Sketches by Miss S. Ross-Craig of the corona of *Caralluma subterranea* E. A. Bruce et P. R. O. Bally, showing variation in length and dentation of inner lobes.

longi, 1 mm. lati, glabri, corollae sinus attingentes vel leviter excedentes, cum glandulis parvis alternantes. *Corolla* atro-punicea, rutila vel rare flava, rotata, 1.5-1.7 cm. diametro, fere ad basin divisa; tubus brevissimus, circiter 2 mm. longus, late campanulatus, glaber; lobi 5, patenti, anguste triangulari-lanceolati vel nonnumquam ovato-lanceolati, acuminati, 5-7 mm. longi, circiter 3 mm. lati, marginibus leviter recurvis, extra glabri et laeves, intus hispidulati. *Corona* duplex, glabra, interiore et exteriore in corpus unum confluentibus e tubo corallae exserta; corona exterior tubo circiter 2 mm. longo in pocula 5 humilia fere patentia margine truncata minute irregulariter eroso-denticulata usque alta erecta alte emarginata haud eroso-denticulata divisa: lobi interiores 5 oblongi, circiter 1.5 mm. longi, 1 mm. lati, apice irregulariter 2-5 dentati, dorso prope basin incrassati et rugulosi, basi inter pocula appendice brevi 0.5 mm. longa irregulariter 1-3 dentata erecta praediti, conniventes vel imbricantes, antheris incumbentes. *Folliculi* non visi.

KENYA COLONY. Sagalla, Boy Joanna S (20) (type). *Kisigau, Boy Joanna S (4). Ngong Hills*, 1800 m., on rocky ground in grass with *Dorstenia barnimiana, Monadenium, Geranium inaequilobum* and *Crassula*, fl. 20 Nov. 1938, P. R. O. Bally S (13) [Coryndon Museum 8607].

C. subterranea belongs to the "Ango" Group (White & Sloane "The Stapeliae," Ed. 2, 1: 161) a difficult and little known section of *Caralluma*, the species of which are mainly distinguished by slight differences in the corolla and corona. The long spreading underground rhizomes are a particularly interesting feature of *C. subterranea* as this character has rarely been observed in other species, though it occurs in *C. vibratilis* (see next page). The variation in coronal structure, flower color and succession are also noteworthy. The plant from Sagalla S (20) develops several flowers at the same time, one in each upper angle of the stem, whereas the other specimens only develop one flower at a time. The variation in the corona can be traced in the four plants which have been examined, at one end of the range the pockets of the outer corona are spreading with frilled margins (rather comparable to *C. Schweinfurthii* A. Berg.), whereas at the other end they are comparatively deep and erect with a central notch and entire margins; the inner lobes vary in their length and toothing, sometimes scarcely touching and at others distinctly overlapping one another. In spite of these variations the *essential* structure of the corona is the same in all these plants and they are considered to be conspecific.

FIG. 104. *Caralluma subterranea* E. A. Bruce et P. R. O. Bally. Photo: P. R. O. Bally.

A specimen collected by Mr. Greenway in the Kitumbini Mts. probably belongs to this species. The plant unfortunately died in cultivation but from Mr. Greenway's photograph and description, which mentions—"deep underground stems"—it is almost certain that the plant is *C. subterranea*.

An unidentified *Caralluma* or *Stapelia* figured in White & Sloane, "The Stapelieae," III. 1183, fig. 1231, which was collected by the late Mr. B. D. Burtt in Shinyanga with the note—" . . . plants spread by many underground stems . . ." appears to be yet another record of this species. It would be very useful if collectors in this area could search for the plant so that the above presumptions could be verified. Mr. Bally has made the interesting observation that flies which visit the flowers are sometimes caught by their legs between the corona-lobes as in a trap and perish on the flower; the same thing has been noted in *C. Dummeri*.

FIG. 105. *Caralluma tubiformis* E. A. Bruce et P. R. O. Bally. Photos by P. R. O. Bally of the type specimen.

Caralluma tubiformis E. A. Bruce et P. R. O. Bally, sp. nov.; affinis *C. distinctae* E. A. Bruce, sed caulibus crassioribus erectis, floribus minoribus, lobis corollae hirsutis, forma corona valde distincta; ab *C. sacculatae* N. E. Br. lobis corollae hirsutis, lobis coronae interioribus apice numquam erectis differt.

Herba perennis, succulenta, 12-15 cm. alta; caules simplices, tetragoni, 1.5-2 cm. diametro, pallide virides, fusco-viridi vel hepatico-maculati; dentes oppositi et decussati, plus minusve erecti, inferne conico-deltoidei, caudato-acuminati, crassi, 1.5-1.8 cm. longi. *Flores* in axillis caulis apicem versus solitarii, erecti; pedicelli 5-8 mm. longi, glabri. *Calycis lobi* patuli, ovato-lanceolati, circiter 5 mm. longi, acuminati, glabri. *Corolla* circiter 2.5 cm. longa, fere usque ad medium 5-lobata; tubus campanulatus, extra glaber, viridis, hepatico-vit-

tatus, intus fusco-purpureo-hepaticus, albido-hirsutus, pilis fauce longioribus usque ad 3 mm. longis, 1.2 cm. longus, fauce circiter 1 cm. diametro; lobi erecto-patuli, triangulares, circiter 1 cm. longi, basi 0.6 cm. lati, acuti, margine recurvi, extra glabri, intus pilis longis albidis hirsuti. *Corona* duplex, interiore et exteriore in corpus unum confluentibus; corona exterior in saccis 5, 3.5 mm. altis 2 mm. diametro divisa; lobi interiores 5, oblongo-triangulares, 1.5-2 mm. longi, apice subacuti, antheris incumbentes, attingentes.

KENYA COLONY. Archer's Post, on rocky ground, locally common, fl. Dec. 1939, Mrs. Copley, S (33) (type).

This new species is closely allied to *C. distincta* E. A. Bruce as both have the comparatively long campanulate corolla-tube and more or less erect corolla-lobes with reflexed margins. *C. tubiformis,* however, differs in the smaller flowers, which are dark purplish-maroon within and green outside with raised maroon markings; the lobes and upper part of the tube are covered with long, fine, white, downward-pointing bristles, which direct the insects to the essential organs of the flower and are thus an aid to pollination. The outer corona is interesting as it is divided into five very pronounced, deep, sack-like pouches. The habit of the species, in the erect 4-angled mottled stem with well developed teeth, is similar to that of *C. Dummeri* but slightly sturdier. The form of the corona closely approaches that of *C. sacculata* and only differs in that the interior corona-lobes are not erect at the tips but are horizontally inflexed over the anthers. The tubular corolla and the erect 4-angled branches are also comparable to *C. sacculata,* which must be considered to be the nearest ally of *C. tubiformis.*

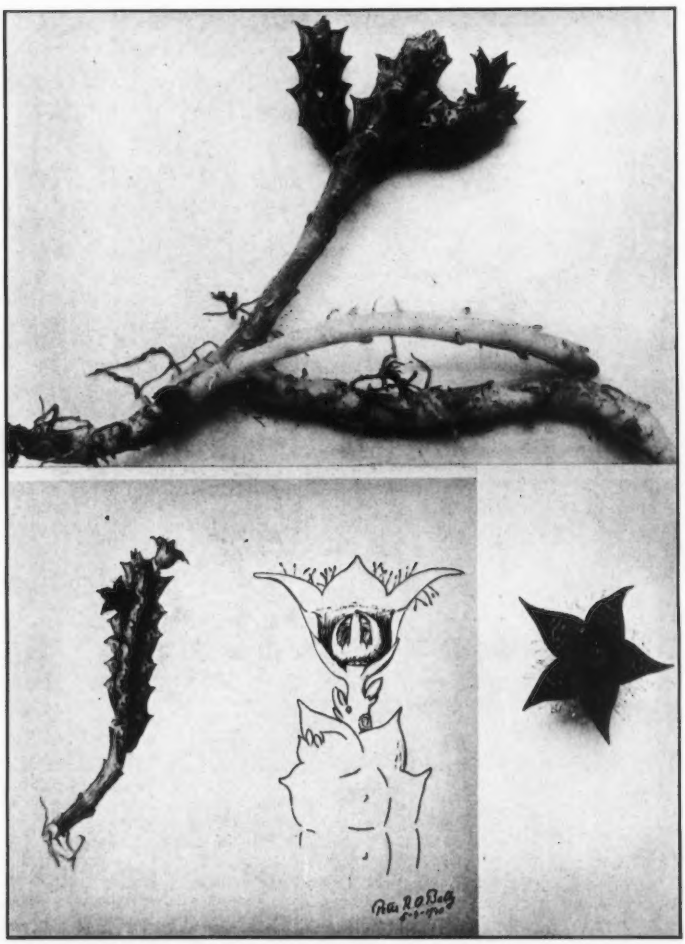

FIG. 106. *Caralluma vibratilis* E. A. Bruce et P. R. O. Bally. Photos by P. R. O. Bally of the type specimen.

(To be continued)

One Year Under Glass

EMIL J. CLARK, 2573 Sage St., Cincinnati, Ohio.

While the operation and precise management of the glasshouse belong to the professional, we shall attempt to view, through the eyes of an amateur, some of the thrills experienced through the first year of operation. Some of the problems confronting the hobbyist can thus be brought in review, enlarging the knowledge of those just starting. The subject of the glasshouse can be of little interest to those having small collections but will give an insight to the problems confronting the more advanced collector who cannot resist adding to an already large collection. For the latter, such a convenience should greatly simplify the care and storage of his plants.

Space does not permit of lengthy detailed description of the various types of houses, but some suggestions may help determine the type best suited for certain needs.

Large collections cannot be shifted about in window sills so all may have enough sunlight. As a result, the plants grow tender, necessitating great care when put out doors in the spring lest they be damaged by sunburn. This sad experience was my lot six years ago. All types of glasshouses afford good light, sunshine and temperature control. If we can simulate nature we will have healthy plants and ample bloom.

Since we are practically all familiar with the

FIG. 107. The author's glasshouse and part of his collection.

commercial type of greenhouse they will not be considered in this article because the average amateur cannot afford one and those that can afford one will consult with experts before buying. For the rest of us, a bay window presents wonderful opportunities to display our ingenuity—glass roof, shelves, bench and storage bins. Basement window hot-bed type of glass enclosure practically describes itself, simply a glass enclosure built around a basement window to provide a means of keeping the frost out of the air around the plants and from the plants themselves. This can be made permanent or set up in the fall for the winter months only. Then there is the lean-to or shed type built against the house. All of these can be heated from the same heating plant that heats the house with little extra cost because 45 to 50 degrees F. is ideal for practically all (there are a very few exceptions) cacti. If you wish to do your own work on the larger types but are not familiar with the squaring, leveling of foundation and frame work and the plumbing, a lot of time and exasperation will be saved by employing competent persons to do this part of the work and there will be plenty of work left for you to do, such as flooring, building benches and shelves, laying and puttying the glass, painting, etc.

For the basement window, old sash and doors can be fitted into a frame work that allows entrance at one end and the open basement window will provide heat on cold days or help ventilation through the open door on hot days.

The bay window type should be fitted with doors to keep the temperature under that of the rest of the home as modern indoor living conditions do not keep plants healthy, dormant and assure flowers when the blooming season arrives as I have found from my personal experience.

I have no means of checking, but I believe my plants started growth much earlier than when kept in the windows of my home. A record was kept this year (1940) and time and amount of growth will be recorded in the future. This will be definite checking.

What led me to build a glasshouse? For years my love of plants led me to collect so many it was becoming a burden to care for them. A table and three windows shelved so high I had to tend them from the top of a stepladder did not allow proper light and some times a pot would get knocked to the floor. Lugging 200 pots outdoors in the spring and back again in the fall was not so much pleasure and as the plants grew so did my problem of caring for them and housing them during the winter. (Most cacti MUST be housed here in Ohio because of the extremes of temperature. February, 1940, saw one day with a maximum temperature of 75 degrees and the next morning was eight. This was only four weeks away from twenty below. Our native plants will not absorb any moisture with less than twelve hours of sunlight and are not affected by these changes.) Each fall more and more of the other house plants had to be discarded to make room for my cacti and other succulents. The solution of my problem was the choice of two alternatives—larger accommodations or stop adding to my collection. The latter was quickly ruled out and I began making plans. Having a 12 by 18 foot open back porch with one end facing south-east it was easy to picture a green house all my own. Taking 6 feet off the room was not hard to do and a wall and door were equally as easy. All that remained to be done was one wall, an end and a roof. The porch foundation and floor were in excellent condition, constituting another saving. Studding, sheathing, heavy roofing paper, galvanized nails, weather boarding, hard-wood flooring for the bench, 1 gallon plastic putty, 2 gallons pine-tar creosote, nails, lumber for making sash, glass and paint totalled less than $40.00. New lumber was used on exposed surfaces only. No labor costs are included because I did all the work. From my attic came the heating plant; a medium sized hot blast stove that holds a good fire about six hours in very cold weather.

My initiation as a glasshouse owner is complete. Summer heat up to 110 degrees and winter down to 17 below zero. For three weeks last winter the temperature ranged from 8 above to 17 below. Twice each night I rose to check the fire. Several times the freezing point was reached inside the glass, and tops of very tender plants froze to the ground. 7 cacti were lost. The freezing was due to wind changes that slowed down or speeded up the fire. This fall I will install a small gas heater to be used on extremely cold nights only. There were anxious days and nights when the wind would howl and lash at my greenhouse. Great globs of ice would form at low points of the roof supports and hang from the rafters. At times 8 inches of ice and snow covered the roof and icicles hung five feet to the ground. I was sure no glass could stand such punishment, so I kept tarpaulin and old linoleum handy for emergencies, but none came. Can anyone think of a more frigid job than trying to repair a glasshouse in the dead of night and a strong wind blowing, with the thermometer at ten below zero? On sunny days this was soon forgotten as the mercury would rise quickly to 85 and even more if the ventilation was not quickly attended to. Chilled bones thawed out and life was good again. With the

coming of evening the mercury would drop as rapidly as it had risen and the ventilators would have to be attended quickly. No attempt was made to keep the temperature stationary; artificial heat of from 35 to 50 degrees was satisfactory. Heat caused by sunshine up to 85 degrees was tolerated. This must have been satisfactory to the plants because the burst of growth and flowers this spring was surprising. Members of the K I O CACTUS CLUB can attest this statement. The cost of heating my greenhouse was about $7.00 for the entire winter. Many days saw the outside temperature above 40 degrees and no fire was made on those days. If the "weather man" said a cold wave was coming the fire would be started in the late afternoon and a final firing before going to bed was usually enough for the night.

Watering was no problem, as the pots were sunk in soil in the bench and this was kept moist. Since January is our worst or coldest month, no water was given from December until the middle of February and none was given during the damp and wet spring days. Some species of cacti shrink as much as 50 per cent during the winter so do not be misled into thinking they need water; the loss of plants by freezing and rotting may result if you do. Many tropical and South American species stood the rigors of the past winter; limited knowledge on my part of the habitat of various species will not allow comment as to why or how the plants survived. For several years previous to building the glasshouse the plants were kept in a cold frame during the summer, the pots buried in the soil, this was satisfactory until the ants located these. When the plants were taken into the greenhouse all plants had to be cleaned of lice and mealy bugs and over forty plants had be root pruned and repotted. Please do not charge me with neglect, as ants live and thrive in wooded and stony areas, the large black ants coming from old stone walls over a hundred feet away.

About eight years ago a neighbor of mine would trade flowers with me and it was on one of these occasions she offered me a few cacti. I actually detested the prickly twining things, but accepted rather than offend. The instructions given were plant them in sandy soil in the sun and water once or twice a week. They existed but did not thrive and grow until the secret of proper watering, soil and sunlight conditions were discovered about two years ago. During the past year many of my plants have grown twenty-five per cent and one over four hundred per cent. What a change in eight years!

TRANSPLANTING YUCCA

From *The American Botanist*
By N. F. PETERSON

Some years ago one of your contributors from South Dakota suggested that it was almost impossible to transplant the native yucca (*Yucca glauca*). I have transplanted several and the difficulty is that one digs out but a small part of the "root" and that it is necessary to remove most of the leaves or the effort will fail. Sometimes I have removed all the leaves of a plant that had bloomed, leaving only the three buds formed at the base of the flower stalk. Removing the large leaves, leaving a tuft about four to six inches of the central leaves, has also worked all right. I have usually tried to get at least 18 inches of the caudex which leaves enough reserve food for starting growth.

I have also started them from seed but this is a slow process in the sandy soil where I wanted them. It seems that it will be a matter of about ten years before they will be large enough to bloom: while transplanted plants require a much shorter period. The first year the seedlings make but a few leaves 3 to 4 inches long. The caudex starts like a rhizome but soon turns straight downwards and it seems to take most of the plant's energy for years to grow this, the bunch of leaves getting a little larger each season. They are grasshopper resistant and are scarcely bothered while *Yucca filamentosa* was destroyed near by.

At St. Louis you asked us what we would like in the JOURNAL. I, personally, would appreciate an article on "Pressing Cactus and Other Succulent Flowers." While I have had quite a lot of flowers this year, the individual life of a flower is so short that generally I don't get a chance to study them as well as I would like. FRED L. WAY.

TEXAS REMOVES BARRIER

Charles Fitzpatrick of Edinburg, Texas, reports that the state of Texas no longer requires out-of-state dealers to purchase a Texas permit.

FIG. 108. Here is the Opuntia ? pictured on page 158. The plant on the right is *Kalanchoe tomentosa* showing propagation from a single leaf.

SPECIAL THIS MONTH, $1 POSTPAID

Choice of any 3 of the following Euphorbias:

6 in. *E. candelabrum*	6 in. *E. lemairiana*
2 in. *E. echinus*	8 in. *E. similis*
4 in. *E. franckiana*	1½ in. *E. squarrosa*
7 in. *E. grandicornis*	8 in. *E. grandidentata*

All 8 for $2.00

Free Illustrated Catalogue No. 5
Californians send 3c tax, please
KNICKERBOCKER NURSERY
P. O. Route 3, San Diego, Calif.

CHECK LIST

Cactus Journal—1 year	$ 3.00
California Cactus—Baxter	1.00
The Stapelieae (3 volumes)—White and Sloane	12.50
The Cactus Book—Houghton	2.25
Cacti—Borg	6.60
Cacti for the Amateur—Paper $1.00; Cloth	2.00
Succulents for the Amateur- Paper $1.50; Cloth	2.00
Pronouncing Glossary—Marshall, Woods	3.85
Arizona Cacti—new edition	1.00

Postpaid in U. S. A. Foreign add 20c per volume
Box 101, Pasadena, Calif.

TRY THIS ONE

I have had to take cuttings of many of my cactus, with painful consequences, until I thought of using single corrugated paper, with a piece 5x8 cut across the grooves. I handled the worst of the Opuntias without a puncture and used it to support them when planting. C. W. ARMSTRONG.

FOR EXCHANGE

Wanted in exchange: A year's subscription of the Australian "Wild Life" for a year's subscription to the "Cactus and Succulent Journal." If interested you may borrow the copy of "Wild Life" from the Society—Box 101, Pasadena.

Our cacti price list now ready for distribution. Some very attractive offers. Over twelve years in the business. Wholesale and retail. Drop us a card for our price list. Supplements of special offers added from time to time.

A. R. DAVIS
P. O. Box 167, Marathon, Texas

ANNOUNCEMENT—Having acquired the entire reprint of *The Cactaceae,* the 4 Vol. reprint of Britton and Rose, I wish to announce that the small sets are no longer available, but that the large Deluxe sets may now be obtained from me at the new, low, cash price of $50.00 postpaid in U. S. A.

WANTED—Engelmann's *Boundary Survey—Kaktus A. B. C.—Trees and Shrubs of Mexico* (5 vols.), Odd Vols. Britton and Rose (original), old copies of the *Journal* or *Desert* or any Cactus or Succulent books or catalogues. Send me a list of what you wish to dispose of.

FRANK R. MARK, 825 Elyria Dr., Los Angeles

COMMERCIAL DEALERS

QUALITY HILL CACTUS HOME
CACTUS AND SUCCULENTS
559 Evanston Ave. Kansas City, Mo

THE CACTUS GARDENS
WHOLESALE AND RETAIL CACTI AND SUCCULENTS
6000 N. Closner St., Edinburg, Texas.

R. W. POINDEXTER NURSERY
WHOLESALE GROWERS CACTI AND SUCCULENTS
1000 N. Temple St. Compton, Calif.

KNICKERBOCKER NURSERY
CACTI AND SUCCULENTS
Route 3 San Diego, Calif.

Our new 1941 seed and plant catalog now ready. Price 10c postpaid. With Amateur's Surprise Packet—100 mixed seed 25c. Unillustrated price list free.

R. W. KELLY
Box 235-C, Temple City, Calif.

REWARD OFFERED

Two flats containing about one hundred and eighty Cephalocereus senilis, averaging three inches high, were taken from our greenhouse at 911 Vineland, Baldwin Park, on Monday, September 22, valued at about $45.00.

I will consider it a great favor if anyone will notify me if any such plants are offered for sale. This is the third time our place has been burglarized in the last ninety days, and it is to the interest of all cactus growers that the guilty person be caught.

In addition to the fifty dollar reward offered by the California Cactus Growers Association, I will personally pay an additional fifty dollar reward for information leading to the arrest and conviction of the guilty party.

R. W. KELLY,
2410 La Rosa Drive, Temple City, Calif.

I have recently secured 200 plants of *Neomammillaria nivosa* of from 4 to 6 inches in diameter, a few as large as 10 inches, to be sold for $1.00 each.

G. F. ANTON, Box 922, Mayaguez, P. R.

THE CACTUS BOOK
by
A. D. Houghton

From this book you will learn the secrets of successful watering, how to grow Cacti from seeds, how to propagate the rare species by grafting, how to hybridize, how to grow indoors in pots, and on window sills, how to purchase and trade to get new sorts and what kinds to grow for different effects. Also introduces you to more than 1,000 different kinds of Cacti with information for selecting the types you need for every purpose and location.

Cactus & Succulent Society of America
Price $2.25

We do not attempt to edit the names of plants appearing in the advertisements.